

3D9

Page 1 of 7

RECEIVED
JUN 28 2002
TECH CENTER 1600/2900



RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/693,908

DATE: 01/26/2002
TIME: 13:36:55

Input Set : A:\ES.txt
Output Set: N:\CRF3\01262002\I693908.raw

ENTERED

3 <110> APPLICANT: HERMONAT, Paul L.
5 <120> TITLE OF INVENTION: ADENO-ASSOCIATED VIRUS AAV REP78 MAJOR REGULATORY PROTEIN,
MUTANTS
6 THEREOF AND USES THEREOF
8 <130> FILE REFERENCE: 023533/0130
10 <140> CURRENT APPLICATION NUMBER: US 09/693,908
11 <141> CURRENT FILING DATE: 2000-10-23
13 <150> PRIOR APPLICATION NUMBER: US 60/160,608
14 <151> PRIOR FILING DATE: 1999-10-21
16 <160> NUMBER OF SEQ ID NOS: 6
18 <170> SOFTWARE: PatentIn version 3.1
20 <210> SEQ ID NO: 1
21 <211> LENGTH: 26
22 <212> TYPE: DNA
23 <213> ORGANISM: Unknown
25 <220> FEATURE:
26 <223> OTHER INFORMATION: Primer
28 <400> SEQUENCE: 1
29 ccccgaggc cgaattctt gtgcaa 26
32 <210> SEQ ID NO: 2
33 <211> LENGTH: 20
34 <212> TYPE: DNA
35 <213> ORGANISM: Unknown
37 <220> FEATURE:
38 <223> OTHER INFORMATION: Primer
40 <400> SEQUENCE: 2
41 acaagcagga ttgaaggcca 20
44 <210> SEQ ID NO: 3
45 <211> LENGTH: 20
46 <212> TYPE: DNA
47 <213> ORGANISM: Unknown
49 <220> FEATURE:
50 <223> OTHER INFORMATION: Primer
52 <400> SEQUENCE: 3
53 catatcacca gtcacccgtc 20
56 <210> SEQ ID NO: 4
57 <211> LENGTH: 110
58 <212> TYPE: DNA
59 <213> ORGANISM: Human papillomavirus
61 <400> SEQUENCE: 4
62 actacaataa ttcatgtata aaactaaggc cgtaaccgaa atcggttcaa ccgaaaccgg 60
64 ttagtataaa agcagacatt ttatgcacca aaagagaact gcaatgtttc 110
67 <210> SEQ ID NO: 5
68 <211> LENGTH: 4675

RECEIVED

JUN 28 2002

TECH CENTER 1600/2900

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/693,908

DATE: 01/26/2002
TIME: 13:36:55

Input Set : A:\ES.txt
Output Set: N:\CRF3\01262002\I693908.raw

69 <212> TYPE: DNA
70 <213> ORGANISM: adeno-associated virus 2
72 <220> FEATURE:
73 <221> NAME/KEY: CDS
74 <222> LOCATION: (321)..(2183)
75 <223> OTHER INFORMATION:
78 <400> SEQUENCE: 5
79 ttggccactc cctctctgctcg cgctcgctcg ctcactgagg ccgggcgacc aaaggcgcc 60
81 cgacgcccgg gctttgccccg ggccgcctca gtgagcgagc gagcgcgcag agagggagtg 120
83 gccaactcca tcacttagggg ttccctggagg ggtggagtcg tgacgtgaat tacgtcatag 180
85 ggttagggag gtcctgtatt agaggtcagc tgagtgtttt ggcacatttt ggcacaccat 240
87 gtggtcacgc tgggtattta agcccgagtg agcacgcagg gtctccattt tgaagcggga 300
89 ggttgaacg cgccggcc atg ccg ggg ttt tac gag att gtg att aag gtc 353
90 Met Pro Gly Phe Tyr Glu Ile Val Ile Lys Val
91 1 5 10
93 ccc agc gac ctt gac ggg cat ctg ccc ggc att tct gac agc ttt gtg 401
94 Pro Ser Asp Leu Asp Gly His Leu Pro Gly Ile Ser Asp Ser Phe Val
95 15 20 25
97 aac tgg gtg gcc gag aag gaa tgg gag ttg ccg cca gat tct gac atg 449
98 Asn Trp Val Ala Glu Lys Glu Trp Glu Leu Pro Pro Asp Ser Asp Met
99 30 35 40
101 gat ctg aat ctg att gag cag gca ccc ctg acc gtg gcc gag aag ctg 497
102 Asp Leu Asn Leu Ile Glu Gln Ala Pro Leu Thr Val Ala Glu Lys Leu
103 45 50 55
105 cag cgc gac ttt ctg acg gaa tgg cgc cgt gtg agt aag gcc ccg gag 545
106 Gln Arg Asp Phe Leu Thr Glu Trp Arg Arg Val Ser Lys Ala Pro Glu
107 60 65 70 75
109 gcc ctt ttc ttt gtg caa ttt gag aag gga gag agc tac ttc cac atg 593
110 Ala Leu Phe Phe Val Gln Phe Glu Lys Gly Glu Ser Tyr Phe His Met
111 80 85 90
113 cac gtg ctc gtg gaa acc acc ggg gtg aaa tcc atg gtt ttg gga cgt 641
114 His Val Leu Val Glu Thr Thr Gly Val Lys Ser Met Val Leu Gly Arg
115 95 100 105
117 ttc ctg agt cag att cgc gaa aaa ctg att cag aga att tac cgc ggg 689
118 Phe Leu Ser Gln Ile Arg Glu Lys Leu Ile Gln Arg Ile Tyr Arg Gly
119 110 115 120
121 atc gag ccg act ttg cca aac tgg ttc gcg gtc aca aag acc aga aat 737
122 Ile Glu Pro Thr Leu Pro Asn Trp Phe Ala Val Thr Lys Thr Arg Asn
123 125 130 135
125 ggc gcc gga ggc ggg aac aag gtg gtg gat gag tgc tac atc ccc aat 785
126 Gly Ala Gly Gly Asn Lys Val Val Asp Glu Cys Tyr Ile Pro Asn
127 140 145 150 155
129 tac ttg ctc ccc aaa acc cag cct gag ctc cag tgg gcg tgg act aat 833
130 Tyr Leu Leu Pro Lys Thr Gln Pro Glu Leu Gln Trp Ala Trp Thr Asn
131 160 165 170
133 atg gaa cag tat tta agc gcc tgt ttg aat ctc acg gag cgt aaa cgg 881
134 Met Glu Gln Tyr Leu Ser Ala Cys Leu Asn Leu Thr Glu Arg Lys Arg
135 175 180 185
137 ttg gtg gcg cag cat ctg acg cac gtg tcg cag acg cag gag aac 929

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/693,908

DATE: 01/26/2002
TIME: 13:36:55

Input Set : A:\ES.txt
Output Set: N:\CRF3\01262002\I693908.raw

279	ctcaacttca	agctcttaa	cattcaagtc	aaagaggta	cgcagaatga	cggtacgacg	3193
281	acgattgcca	ataacattac	cagcacgggt	caggttttta	ctgactcgga	gtaccagctc	3253
283	cgtacgtcc	tcggctcggc	gcatcaagga	tgcctccgc	cgttccca	agacgtctc	3313
285	atgggccac	agtatggata	cctcaccctg	aacaacggga	gtcaggcagt	aggacgctct	3373
287	tcattttact	gcctggagta	ctttccttct	cagatgctgc	gtaccggaaa	caactttacc	3433
289	ttcagctaca	cttttgagga	cgttccttcc	cacagcagct	acgctcacag	ccagagtctg	3493
291	gaccgtctca	tgaatcctct	catcgaccag	tacctgtatt	acttgagcag	aacaaacact	3553
293	ccaagtggaa	ccaccacgca	gtcaaggctt	cagttttctc	aggccggagc	gagtgcatt	3613
295	cgggaccagt	ctaggaactg	gtttccttgc	ccctgttacc	gccagcagcg	agtatcaaag	3673
297	acatctgcgg	ataacaacaa	cagtgaatac	tcgtggactg	gagctaccaa	gtaccaccc	3733
299	aatggcagag	actctctgggt	gaatccggcc	atggcaagcc	acaaggacga	tgaagaaaag	3793
301	tttttcctc	agagcggggt	tctcatctt	gggaagcaag	gctcagagaa	aacaaatgtg	3853
303	aacattgaaa	aggcatgtat	tacagacgaa	gagggaaatcg	gaacaaccaa	tccctggct	3913
305	acggagcagt	atggttctgt	atctaccaa	ctccagagag	gcaacagacaa	agcagctacc	3973
307	gcagatgtca	acacacaagg	cgtttccca	ggcatggct	ggcaggacag	agatgtgtac	4033
309	tttcagggggc	ccatctggc	aaagattcca	cacacggacg	gacatttca	ccctctccc	4093
311	ctcatgggt	gattcggact	taaacaccc	cctccacaga	ttctcatcaa	gaacaccccg	4153
313	gtacctgcga	atcctcgcac	cacccatcg	gccccaaagt	ttgcttcctt	catcacacag	4213
315	tactccacgg	gacacggta	gcgtggagat	cgagtggag	ctgcagaagg	aaaacagcaa	4273
317	acgctggaat	cccgaaattc	agtacacttc	caactacaac	aagtctgtt	atcggtgact	4333
319	taccgtggat	actaatggcg	tgtattcaga	gcctcgcccc	attggcacca	gataacctgac	4393
321	tcgtaatctg	taattgttt	ttaatcaata	aaccgtttaa	ttcggtttag	ttgaacttt	4453
323	gtctctgcgt	atttctttct	tatcttagtt	ccatggctac	gtagataagt	agcatggcg	4513
325	gttaatcatt	aactacaagg	aacccttagt	gatggagtt	gccactccct	ctctgcgcgc	4573
327	tcgctcgctc	actgaggccg	ggcgaccaa	ggtcgcccc	cgcccgccgt	ttgccccggc	4633
329	ggcctcagtg	agcgagcggag	cgcgcagaga	gggagtgcc	aa		4675

332 <210> SEQ ID NO: 6

333 <211> LENGTH: 621

334 <212> TYPE: PRT

335 <213> ORGANISM: adeno-associated virus 2

337 <400> SEQUENCE: 6

339	Met	Pro	Gly	Phe	Tyr	Glu	Ile	Val	Ile	Lys	Val	Pro	Ser	Asp	Leu	Asp
340	1					5				10					15	
343	Gly	His	Leu	Pro	Gly	Ile	Ser	Asp	Ser	Phe	Val	Asn	Trp	Val	Ala	Glu
344						20				25					30	
347	Lys	Glu	Trp	Glu	Leu	Pro	Pro	Asp	Ser	Asp	Met	Asp	Leu	Asn	Leu	Ile
348						35				40					45	
351	Glu	Gln	Ala	Pro	Leu	Thr	Val	Ala	Glu	Lys	Leu	Gln	Arg	Asp	Phe	Leu
352						50				55					60	
355	Thr	Glu	Trp	Arg	Arg	Val	Ser	Lys	Ala	Pro	Glu	Ala	Leu	Phe	Phe	Val
356						65				70					75	
359	Gln	Phe	Glu	Lys	Gly	Glu	Ser	Tyr	Phe	His	Met	His	Val	Leu	Val	Glu
360						85				90					95	
363	Thr	Thr	Gly	Val	Lys	Ser	Met	Val	Leu	Gly	Arg	Phe	Leu	Ser	Gln	Ile
364						100				105					110	
367	Arg	Glu	Lys	Leu	Ile	Gln	Arg	Ile	Tyr	Arg	Gly	Ile	Glu	Pro	Thr	Leu
368						115				120					125	
371	Pro	Asn	Trp	Phe	Ala	Val	Thr	Lys	Thr	Arg	Asn	Gly	Ala	Gly	Gly	
372						130				135					140	

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/693,908

DATE: 01/26/2002
TIME: 13:36:55

Input Set : A:\ES.txt
Output Set: N:\CRF3\01262002\I693908.raw

203	445	450	455	
205	aag gtc acc aag cag gaa gtc aaa gac ttt ttc	cgg tgg gca aag gat		1745
206	Lys Val Thr Lys Gln Glu Val Lys Asp Phe	Phe Arg Trp Ala Lys Asp		
207	460	465	470	475
209	cac gtg gtt gag gtg gag cat gaa ttc tac gtc	aaa aag ggt gga gcc		1793
210	His Val Val Glu Val His Glu Phe Tyr Val Lys	Lys Gly Gly Ala		
211	480	485	490	
213	aag aaa aga ccc gcc ccc agt gac gca gat	ata agt gag ccc aaa cgg		1841
214	Lys Lys Arg Pro Ala Pro Ser Asp Ala Asp	Ile Ser Glu Pro Lys Arg		
215	495	500	505	
217	gtg cgc gag tca gtt gcg cag cca tcg acg	tca gac gcg gaa gct tcg		1889
218	Val Arg Glu Ser Val Ala Gln Pro Ser Thr	Ser Asp Ala Glu Ala Ser		
219	510	515	520	
221	atc aac tac gca gac agg tac caa aac aaa	tgt tct cgt cac gtg ggc		1937
222	Ile Asn Tyr Ala Asp Arg Tyr Gln Asn Lys	Cys Ser Arg His Val Gly		
223	525	530	535	
225	atg aat ctg atg ctg ttt ccc tgc aga caa	tgc gag aga atg aat cag		1985
226	Met Asn Leu Met Leu Phe Pro Cys Arg Gln	Cys Glu Arg Met Asn Gln		
227	540	545	550	555
229	aat tca aat atc tgc ttc act cac gga cag	aaa gac tgt tta gag tgc		2033
230	Asn Ser Asn Ile Cys Phe Thr His Gly Gln	Lys Asp Cys Leu Glu Cys		
231	560	565	570	
233	ttt ccc gtg tca gaa tct caa ccc gtt tct	gtc gtc aaa aag gcg tat		2081
234	Phe Pro Val Ser Glu Ser Gln Pro Val Ser	Val Val Lys Lys Ala Tyr		
235	575	580	585	
237	cag aaa ctg tgc tac att cat cat atc atg	gga aag gtg cca gac gct		2129
238	Gln Lys Leu Cys Tyr Ile His His Ile Met	Gly Lys Val Pro Asp Ala		
239	590	595	600	
241	tgc act gcc tgc gat ctg gtc aat gtg gat	ttg gat gac tgc atc ttt		2177
242	Cys Thr Ala Cys Asp Leu Val Asn Val	Asp Leu Asp Asp Cys Ile Phe		
243	605	610	615	
245	gaa caa taaatgattt aaatcaggta tggctgccga	tggtatctt ccagattggc		2233
246	Glu Gln			
247	620			
249	tcgaggacac tctctctgaa ggaataagac agtggtgaa	gctcaaacct ggcccaccac		2293
251	caccaaagcc cgcatcgcc cataaggacg acagcagggg	tcttgctt cctgggtaca		2353
253	agtacctcg accctcaac gactctgaca agggagagcc	ggtaacacgag gcagacgccc		2413
255	cggccctcg gcacgtacaa agcctacgac cggcagctcg	acagcggaga caacccgtac		2473
257	ctcaagtaca accacgccc cgcggagtt caggagcgcc	ttaaagaaga tacgtcttt		2533
259	ggggcaacc tcggacgagc agtcttccag	gcgaaaaaga ggttcttga acctctggc		2593
261	ctggttgagg aaccgtttaa gacggctccg	ggaaaaaaga ggccgtaga gcactctcct		2653
263	gtggagccag actccctcctc gggaccgga aaggccggcc	agcagcctgc aaaaaaaga		2713
265	ttgaattttg gtcagactgg agacgcagac tcagttac	cccccagcc tctccggacag		2773
267	ccaccagcag cccctctgg tctggaaact aatacgatgg	ctacaggcag tggcgcacca		2833
269	atggcagaca ataacgaggg cgccgacgga gtggtaatt	cctccggaaa ttggcattgc		2893
271	gattccacat ggatgggcga cagactcatc accaccagca	cccgaacctg ggccctgccc		2953
273	acctacaaca accacctcta caaacaaatt tccagccat	caggagccctc gaacgacaat		3013
275	cactacttt gctacagcac cccttgggg tattttgact	tcaacagatt ccactgccac		3073
277	tttcaccac gtgactggca aagactcatc aacaacaact	ggggattccg acccaagaga		3133

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/693,908

DATE: 01/26/2002
TIME: 13:36:55

Input Set : A:\ES.txt
Output Set: N:\CRF3\01262002\I693908.raw

138	Leu	Val	Ala	Gln	His	Leu	Thr	His	Val	Ser	Gln	Thr	Gln	Glu	Gln	Asn	
139	190					195						200					
141	aaa	gag	aat	cag	aat	ccc	aat	tct	gat	gcg	ccg	gtg	atc	aga	tca	aaa	977
142	Lys	Glu	Asn	Gln	Asn	Pro	Asn	Ser	Asp	Ala	Pro	Val	Ile	Arg	Ser	Lys	
143	205					210						215					
145	act	tca	gcc	agg	tac	atg	gag	ctg	gtc	ggg	tgg	ctc	gtg	gac	aag	ggg	1025
146	Thr	Ser	Ala	Arg	Tyr	Met	Glu	Leu	Val	Gly	Trp	Leu	Val	Asp	Lys	Gly	
147	220					225					230					235	
149	att	acc	tcg	gag	aag	cag	tgg	atc	cag	gag	gac	cag	gcc	tca	tac	atc	1073
150	Ile	Thr	Ser	Glu	Lys	Gln	Trp	Ile	Gln	Glu	Asp	Gln	Ala	Ser	Tyr	Ile	
151	240					245						250					
153	tcc	ttc	aat	gcg	gcc	tcc	aac	tcg	cg	tcc	caa	atc	aag	gct	gcc	ttg	1121
154	Ser	Phe	Asn	Ala	Ala	Ser	Asn	Ser	Arg	Ser	Gln	Ile	Lys	Ala	Ala	Leu	
155	255					260						265					
157	gac	aat	gcg	gga	aag	att	atg	agc	ctg	act	aaa	acc	gcc	ccc	gac	tac	1169
158	Asp	Asn	Ala	Gly	Lys	Ile	Met	Ser	Leu	Thr	Lys	Thr	Ala	Pro	Asp	Tyr	
159	270					275						280					
161	ctg	gtg	ggc	cag	cag	ccc	gtg	gag	gac	att	tcc	agc	aat	cg	att	tat	1217
162	Leu	Val	Gly	Gln	Gln	Pro	Val	Gl	Asp	Ile	Ser	Ser	Asn	Arg	Ile	Tyr	
163	285					290						295					
165	aaa	att	ttg	gaa	cta	aac	ggg	tac	gat	ccc	caa	tat	g	g	tcc	gtc	1265
166	Lys	Ile	Leu	Glu	Leu	Asn	Gly	Tyr	Asp	Pro	Gln	Tyr	Ala	Ala	Ser	Val	
167	300					305					310					315	
169	ttt	ctg	gga	tgg	gcc	acg	aaa	aag	tcc	g	aag	agg	aac	acc	atc	tgg	1313
170	Phe	Leu	Gly	Trp	Ala	Thr	Lys	Lys	Phe	Gly	Lys	Arg	Asn	Thr	Ile	Trp	
171	320					325						330					
173	ctg	ttt	ggg	cct	gca	act	acc	ggg	aag	acc	aac	atc	g	g	gcc	ata	1361
174	Leu	Phe	Gly	Pro	Ala	Thr	Thr	Gly	Lys	Thr	Asn	Ile	Ala	Glu	Ala	Ile	
175	335					340						345					
177	gcc	cac	act	gtg	ccc	tcc	tac	ggg	tgc	gta	aac	tgg	acc	aat	gag	aac	1409
178	Ala	His	Thr	Val	Pro	Phe	Tyr	Gly	Cys	Val	Asn	Trp	Thr	Asn	Glu	Asn	
179	350					355						360					
181	ttt	ccc	tcc	aac	gac	tgt	gtc	gac	aag	atg	gtg	atc	tgg	tgg	gag	gag	1457
182	Phe	Pro	Phe	Asn	Asp	Cys	Val	Asp	Lys	Met	Val	Ile	Trp	Trp	Glu	Glu	
183	365					370						375					
185	ggg	aag	atg	acc	gcc	aag	gtc	gtg	gag	tcg	gcc	aaa	gcc	att	ctc	gga	1505
186	Gly	Lys	Met	Thr	Ala	Lys	Val	Val	Glu	Ser	Ala	Lys	Ala	Ile	Leu	Gly	
187	380					385					390					395	
189	gga	agc	aag	gtg	cgc	gtg	gac	cag	aaa	tgc	aag	tcc	tcg	gcc	cag	ata	1553
190	Gly	Ser	Lys	Val	Arg	Val	Asp	Gln	Lys	Cys	Lys	Ser	Ser	Ala	Gln	Ile	
191	400					405						410					
193	gac	ccg	act	ccc	gtg	atc	gtc	acc	tcc	aac	acc	aat	tg	tg	gcc	gtg	1601
194	Asp	Pro	Thr	Pro	Val	Ile	Val	Thr	Ser	Asn	Thr	Asn	Met	Cys	Ala	Val	
195	415					420						425					
197	att	gac	ggg	aac	tca	acg	acc	tcc	gaa	cac	cag	cag	ccg	ttg	caa	gac	1649
198	Ile	Asp	Gly	Asn	Ser	Thr	Thr	Phe	Glu	His	Gln	Gln	Pro	Leu	Gln	Asp	
199	430					435						440					
201	cgg	atg	ttc	aaa	ttt	gaa	ctc	acc	cgc	cgt	ctg	gat	cat	gac	ttt	ggg	1697
202	Arg	Met	Phe	Lys	Phe	Glu	Leu	Thr	Arg	Arg	Leu	Asp	His	Asp	Phe	Gly	

```
=> s adeno?  
    16 FILES SEARCHED...  
L1      1759336 ADENO?  
  
=> s l1 and vir?  
    10 FILES SEARCHED...  
    21 FILES SEARCHED...  
    31 FILES SEARCHED...  
L2      200183 L1 AND VIR?  
  
=> s l2 and rep?  
    6 FILES SEARCHED...  
   16 FILES SEARCHED...  
   22 FILES SEARCHED...  
   26 FILES SEARCHED...  
   27 FILES SEARCHED...  
L3      92098 L2 AND REP?  
  
=> s l3 and 78  
L4      9548 L3 AND 78  
  
=> s l4 and mutant  
    32 FILES SEARCHED...  
L5      4090 L4 AND MUTANT
```